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Regarding "Assessment of ocular perfusion after carotid endarterectomy with color-flow duplex scanning"

To the Editors:

In the recent report by E. Jerry Cohn, Jr, and colleagues (*J Vasc Surg* 1999;29:665-71), the discussion contains an error in the sentence, "The use of the OPG has been largely abandoned...because concern existed about the nonphysiologic pressures that were applied to the globe..." The maximum intraocular pressure generated with the ocular pneumoplethysmograph (OPG-Gee) is 145 mm Hg. This is a physiologic intraocular pressure. It has been shown that vigorous contraction of the muscles involved in eyelid closure elevates the intraocular pressure to 90 mm Hg.¹ Other investigators demonstrated that simple rubbing of the eye elevates the intraocular pressure to the 150 to 250 mm Hg range.² Most individuals perform this act several times a day, every day of their lives, and it is instinctive. One need only witness the tired child with both fists boring into the respective orbits as relief is sought as a result of a few mm Hg decrease of the intraocular pressure. Less remote is the medical student preparing for the first examination in gross anatomy, who leans back, after hours of studying, and vigorously rubs the eyes. The effect is simple, elevation of the intraocular pressure above ophthalmic systolic pressure, interruption of arterial inflow and increase of fluid outflow, resulting in a reduction of the intraocular pressure by several mm Hg, which feels good and is most physiologic! The intraocular pressure is elevated by increasing the tension in the corneoscleral shell, and the two methods of increasing the tension, scleral indentation and scleral vacuum, are identical in their effect on the globe. The instrument and its application have been defended in the ophthalmic literature.³⁻⁶

Oculo-oscillodynamography (OODG-Ulrich), mentioned by the authors, was developed by an ophthalmologist.⁷ This instrument closely parallels the OPG-Gee in design and function. Recent papers attest to the value of this device.^{8,9}

One wonders why, in their series of 29 patients, the authors excluded the data from the eyes contralateral to the side of operation. A recent report contains the bilateral ocular volume change per minute, before and after carotid endarterectomy, in 1737 patients.¹⁰ Of particular interest, in the latter report, is the considerable dif-

ference in ocular hemodynamics that exists between male and female patients.

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Reply

My co-authors and I appreciate the comments of Dr Gee. We would join countless other members of our specialty in praise of his innovative contribution to the non-invasive diagnosis of carotid artery occlusive disease. Nevertheless, I believe that he has taken statements made in our manuscript somewhat out of context. Indeed, the emphasis of the statement he notes is that the use of oculoplethysmography (OPG) was abandoned because duplex ultrasound scanning provided more accurate and direct hemodynamic evaluation of disease of the carotid bifurcation. Surely, this is undeniable. The mention of suction applied to the globe of the eye during the performance of OPG was noted as a secondary concern. Clearly, countless OPGs were performed over the years with only anecdotal ocular complications being observed. Nevertheless, as any member of our specialty in my generation would testify, there were more than a